Air Live®
Powered by OvisLink Corp.

WN-380USB

Long Range Wireless-B/G/N Palm Size USB Adapter with Detachable Antenna

User's Manual

www.airlive.com

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FCC Interference Statement

This equipment has been tested and found to comply with the limits for a Class B digital device pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against radio interference in a commercial environment.

This equipment can generate, use and radiate radio frequency energy and, if not installed and used in accordance with the instructions in this manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause interference, in which case the user, at his own expense, will be required to take whatever measures are necessary to correct the interference.

CE Declaration of Conformity

This equipment complies with the requirements relating to electromagnetic compatibility, EN 55022/A1 Class B.

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Table of contents

1. Introduction 1

2. Specification 3

3. Installation/ Un-installation 5

3.1 Installation 5

3.2 Un-Installation 8

4. WLAN: Wireless LAN Management GUI 11

4.1 Introduction of Main Window 11

4.2 Station Mode 19

4.3 Access Point Mode 26

5. Appendix 33

5.1 Troubleshooting 33

5.2 Glossary 33

1 Introduction

Thank you for purchasing Wireless LAN USB Adapter. Wireless LAN USB Adapter is a perfect combination of both performance and cost-effective product introduced. It is sincerely hoped that you can enjoy the wireless world through this solidly profiled wireless adapter.

It provides a full solution of all the IEEE 802.11 b/g/n protocols, which pass the WiFi tests and are compatible with all the wireless products with WiFi logo. If you have a Wireless LAN USB Adapter on hand, it means you can connect to the wireless world without any difficulty.

It also provides all the data rates in the IEEE 802.11 b/g/n standards, with both short and long preambles to ensure the compatibility of legacy wireless products and new ones, saving the panic works for end users to find compatible products.

Since the security issue has become one of the most important one in the wireless society, it provides you with the full security coverage from the 64/128bits WEP encryptions, second generation WPA-PSK encryption, to the most advanced WPA2-AES encryption. WPA2 is the latest security standard currently approved by WiFi standards.

Saving mode, Ad-hoc wireless LAN, Wake on LAN (WOL) and other exciting features are also included in this Wireless LAN USB Adapter. This user manual will guide you through these exciting features in the following chapters and we is believed that you will be greatly satisfied with its performance and ease of use.

2 Specification

Standards	IEEE 802.11 b/g/n standards compliant
Antenna	5dBi
Frequency Range	2.400GHz~2.4835GHz
Operating Frequency / Channel	- 2.412~2.462GHz (Canada, FCC) / 11 Channels - 2.412~2.484GHz (Japan, TELEC) / 14 Channels - 2.412~2.472GHz (Euro, ETSI) / 13 Channels
Security	- WEP 64/128 - WPA, WPA2
Access Protocol	CSMA/CA
Output Power (HIGH-POWER)	- 11n: 22dBm (Typical) ± 1 - 11g: 24dBm (Typical) ±1 - 11b: 28dBm (Typical) ±1
Data Rate	- 11n (40MHz): up to 150M/300bps - 11n (20MHz): up to 72/144Mbps - 11g: 54, 48, 36, 24, 18, 12, 9 and 6Mbps - 11b: 11, 5.5, 2, and 1Mbps with auto-rate fall back
Sensitivity	- 11n: 90dBm - 11g: 92dBm - 11b: 95dBm
Host Interface	A-Type USB 2.0 connector
Operation Voltage	5V DC
Environment Specifications	- Operating Temp : 0℃ to 60℃ - Storage Temp : -20℃ to 70℃ - Storage Humidity: 10% to 90% Non-Condensing
Physical Specifications	99(L) x 60(W) x 16(H)
Operating System Support	- Windows® 98SE/ME/2000/XP/VISTA/, Win 7, Mac and Linux
Approval	- FCC Part 15 - CE

SYSTEM REQUIREMENTS

Windows System: Windows, 2000, XP 32/64 bit, Vista 32/64 bit, and Win 7 32/64bit

PCs must have a device driver installed. It allows you to communicate with WLAN Mini USB Adapter.

PACKAGE CONTENTS

1. Wireless LAN USB Adapter
2. Installation Software CD
3. User Manual

3 Installation/ Un-installation

Warning! Do not cover or block the airflow to the adapter. The adapter will reach a high temperature during use.

3.1 Installation

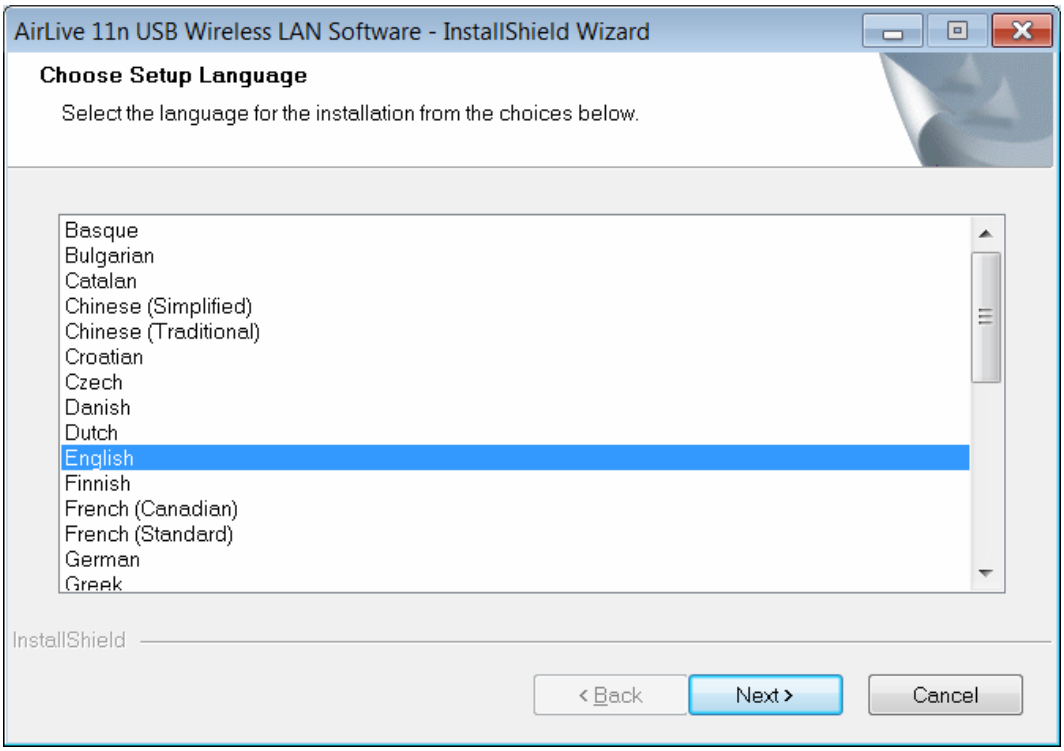
Before you proceed with the installation, please notice the following descriptions.

Note1: The following installation was operated under Windows Vista. (Procedures are similar for Windows /2000/XP.)

Note2: If you have installed the WLAN USB driver & utility before, please uninstall the old version first.

1. Do not plug the wireless LAN USB adapter into your computer USB port before installing the software program. Insert the software program CD , then auto installation window pops up on following:
2. While the following screen pops out, click Install Driver And Utility

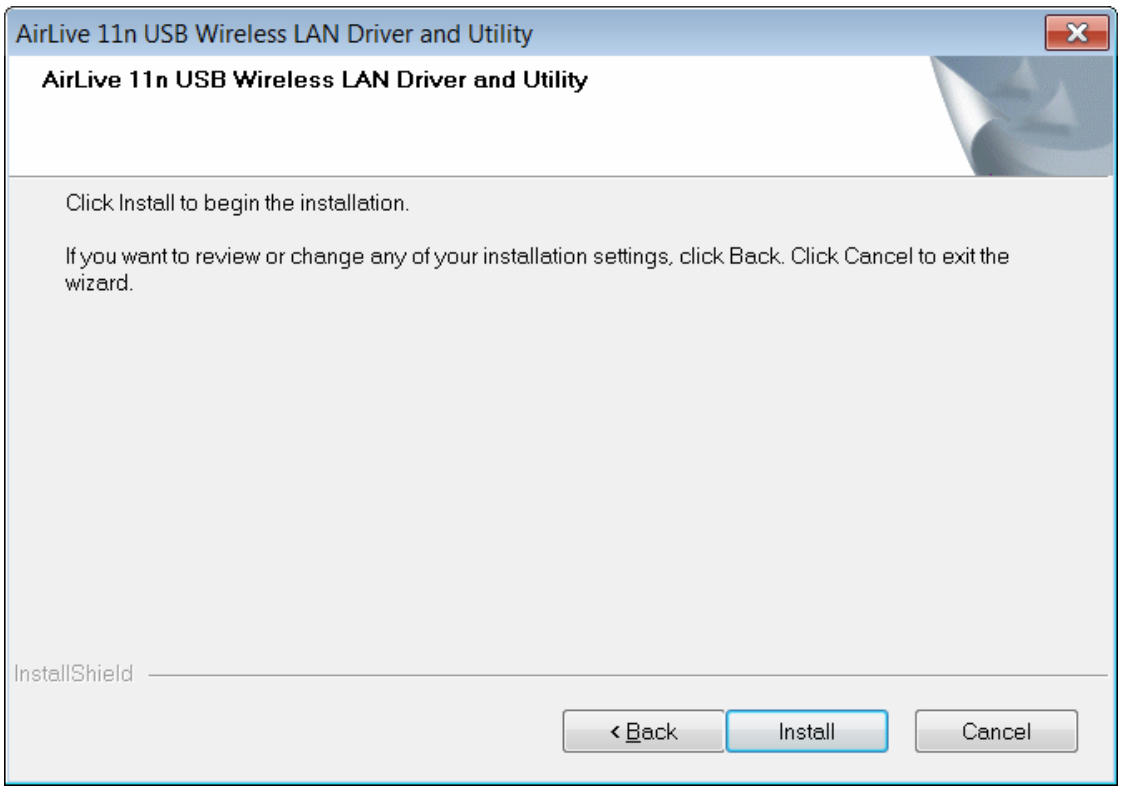
3. Choose a set up language. Click Next to process the installation.



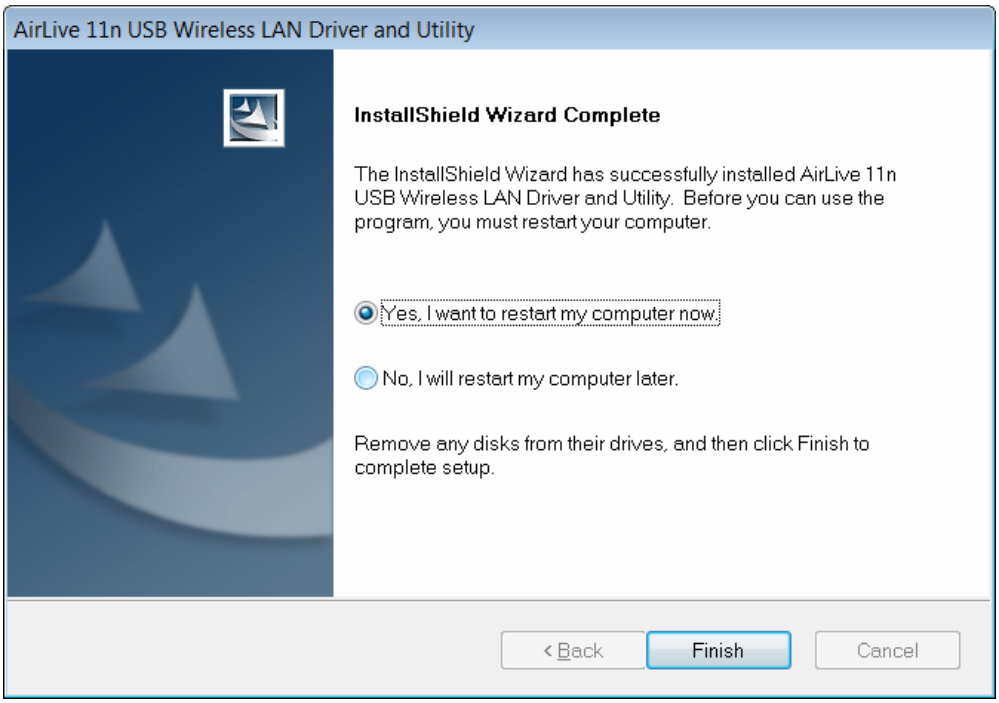
4. Click **Next**

AirLive 11n USB Wireless LAN Driver and Utility
AirLive 11n USB Wireless LAN Driver and Utility
The InstallShield Wizard will install AirLive 11n USB Wireless LAN Driver and Utility on your computer. To continue, click Next.
< Back
Next >
Cancel

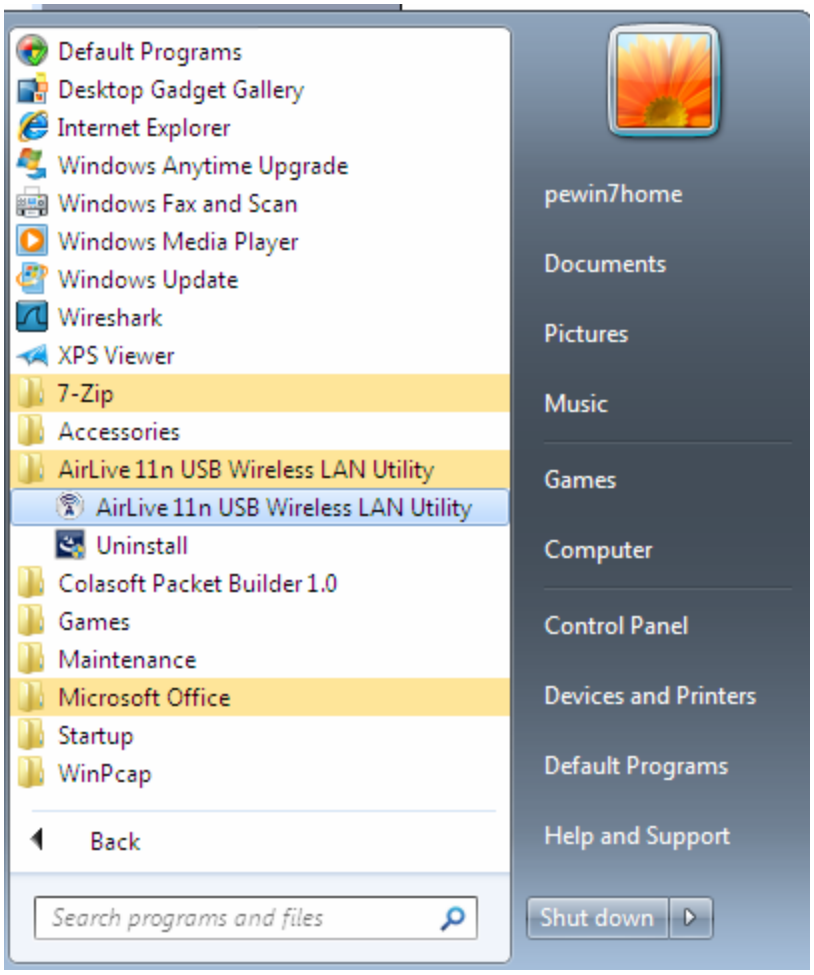
5. Click **Install**


AirLive 11n USB Wireless LAN Driver and Utility
AirLive 11n USB Wireless LAN Driver and Utility
Click Install to begin the installation.
If you want to review or change any of your installation settings, click Back. Click Cancel to exit the wizard.
InstallShield
< Back
Install
Cancel

6. Click **Finish** to complete the installation


AirLive 11n USB Wireless LAN Driver and Utility
InstallShield Wizard Complete
The InstallShield Wizard has successfully installed AirLive 11n USB Wireless LAN Driver and Utility. Before you can use the program, you must restart your computer.
Yes, I want to restart my computer now.
No, I will restart my computer later.
Remove any disks from their drives, and then click Finish to complete setup.
< Back
Finish
Cancel

7. After click **Finish** to complete the installation, under Windows Vista <ALL Programs> menu, AirLive USB wireless LAN Utility program installed.

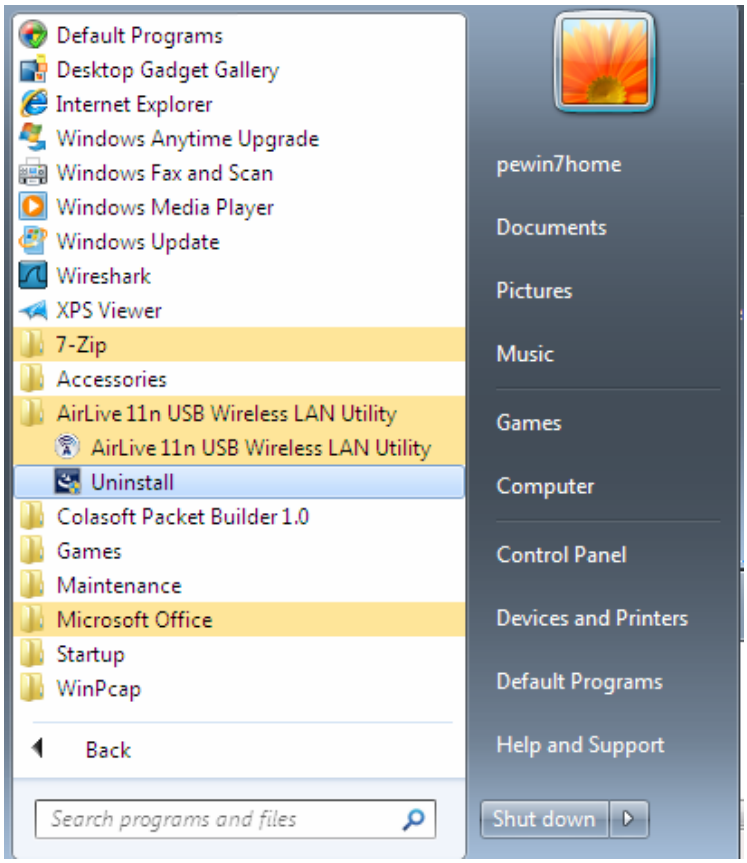


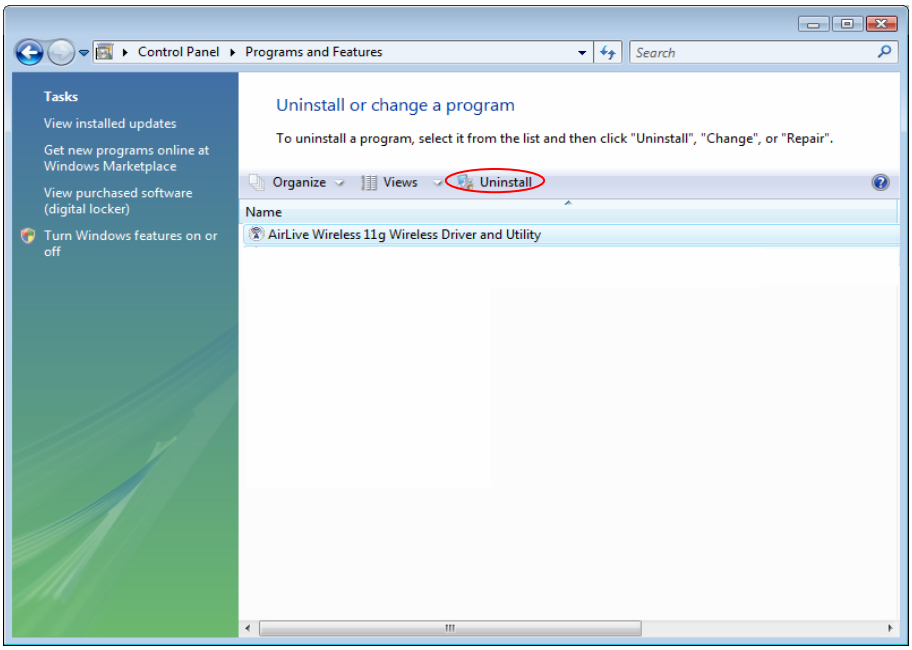
8. Insert the wireless LAN USB adapter into your computer USB port, the computer detect and drive the wireless LAN USB adapter automatically.

3.2 Un-Installation

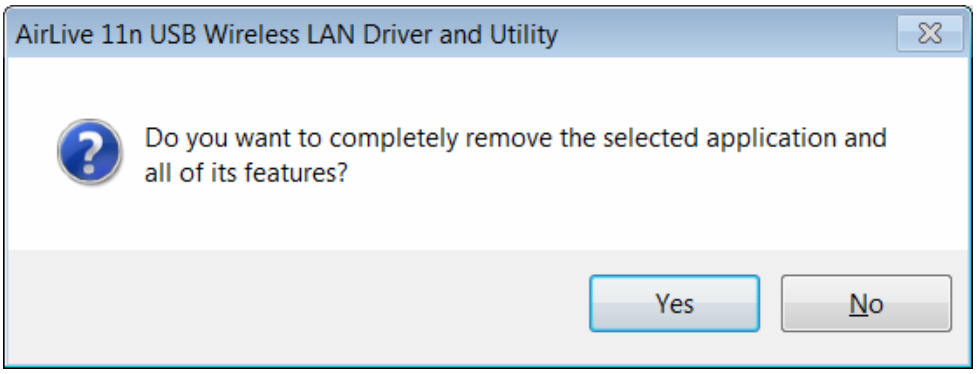
From “Wireless Network Driver and Utility”, “Control Panel” ”Change or Remove Programs”.

A. Uninstall the WLAN USB Adapter Driver from “Start”, “All Programs”, Click “Uninstall” (or “Change/Remove”) to remove Wireless LAN USB Adapter driver.

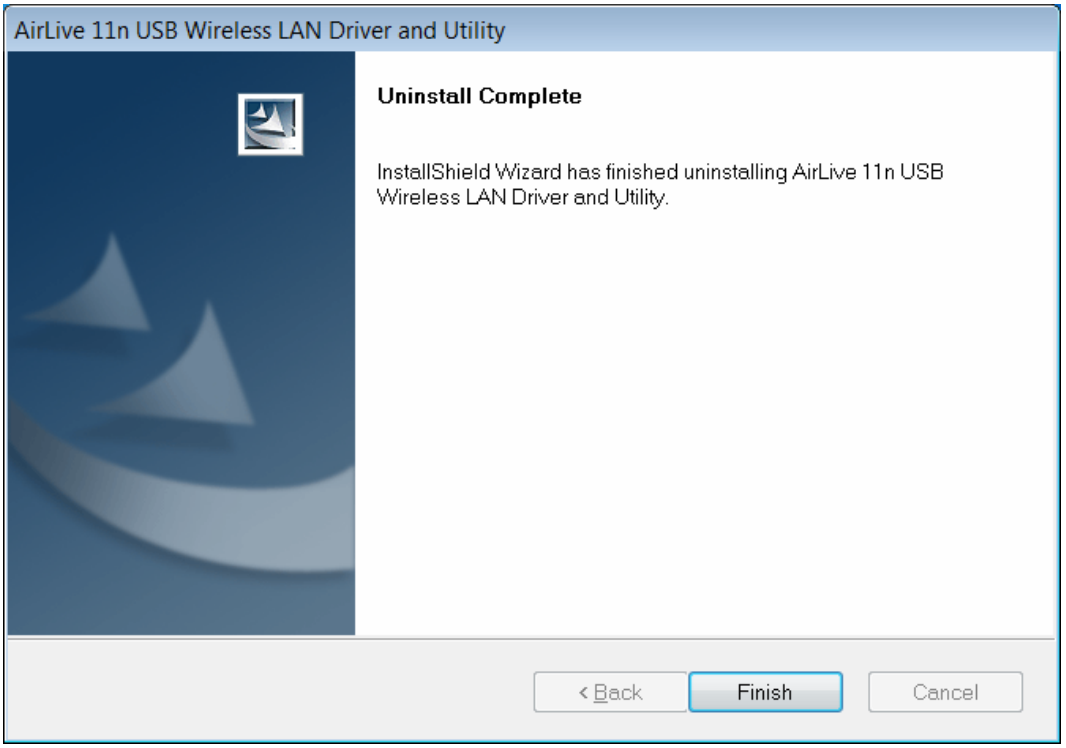

Default Programs
Desktop Gadget Gallery
Internet Explorer
Windows Anytime Upgrade
Windows Fax and Scan
Windows Media Player
Windows Update
Wireshark
XPS Viewer
7-Zip
Accessories
AirLive 11n USB Wireless LAN Utility
AirLive 11n USB Wireless LAN Utility
Uninstall
Colasoft Packet Builder 1.0
Games
Maintenance
Microsoft Office
Startup
WinPcap
Back
Search programs and files
pewin7home
Documents
Pictures
Music
Games
Computer
Control Panel
Devices and Printers
Default Programs
Help and Support
Shut down


Control Panel ▸ Programs and Features
Search
Tasks
View installed updates
Get new programs online at Windows Marketplace
View purchased software (digital locker)
Turn Windows features on or off
Uninstall or change a program
To uninstall a program, select it from the list and then click "Uninstall", "Change", or "Repair".
Organize
Views
Uninstall
Name
AirLive Wireless 11g Wireless Driver and Utility

B. Click “**Yes**” if you want to remove Wireless LAN USB Adapter Driver.

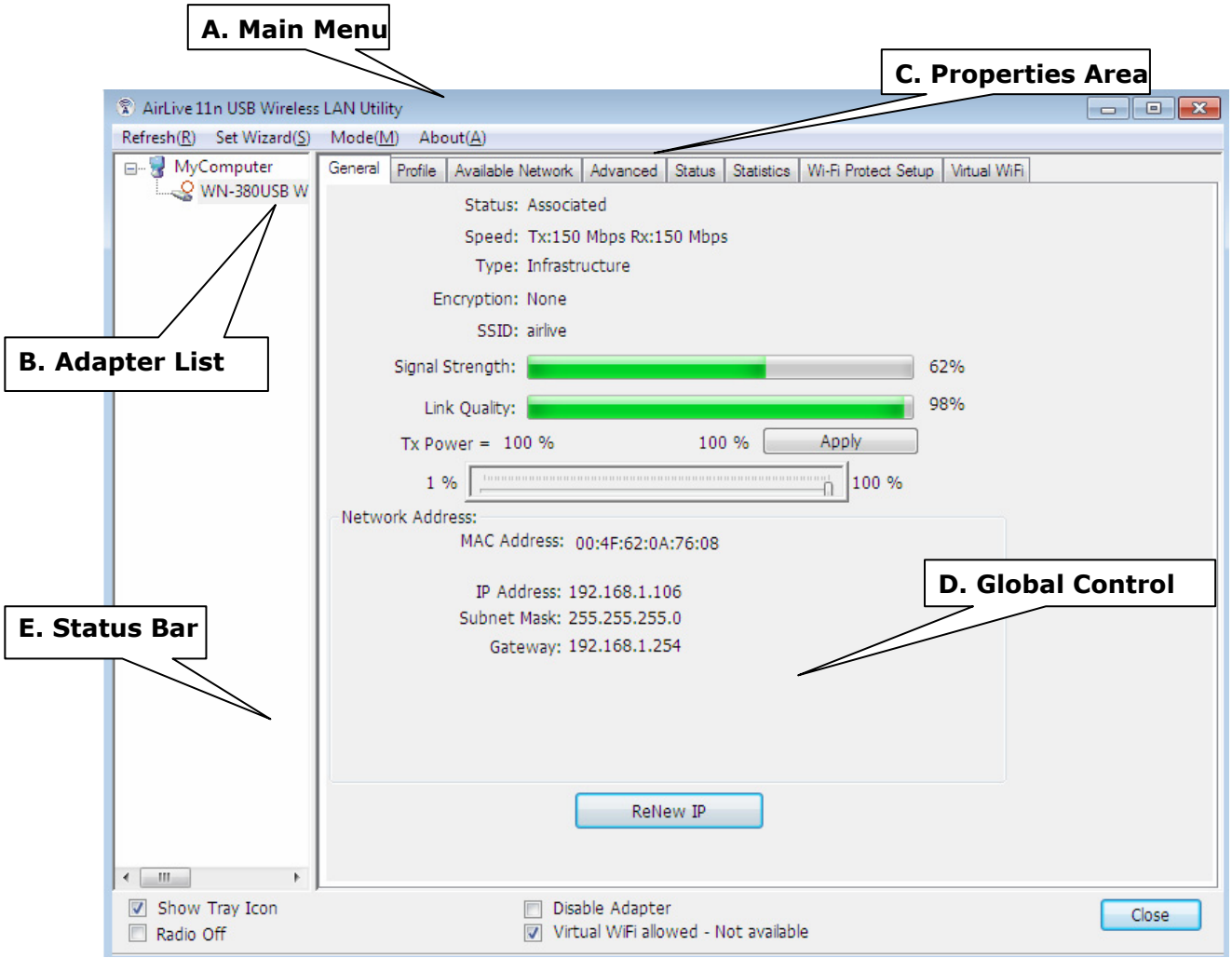

AirLive 11n USB Wireless LAN Driver and Utility
Do you want to completely remove the selected application and all of its features?
Yes
No

Click “**Finish**” to complete the uninstallation.


AirLive 11n USB Wireless LAN Driver and Utility
Uninstall Complete
InstallShield Wizard has finished uninstalling AirLive 11n USB Wireless LAN Driver and Utility.
< Back
Finish
Cancel

4 WLAN: Wireless LAN Management GUI

4.1 Introduction of Main Window



A. Main Menu

The main menu includes five submenus.

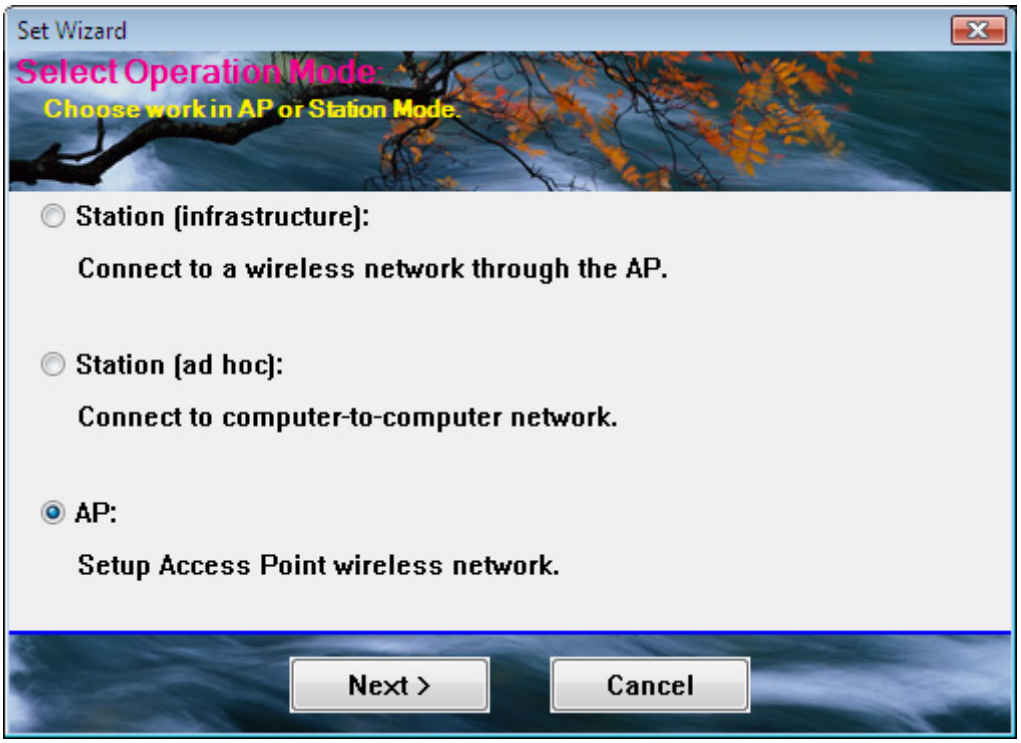
1. Refresh(R)

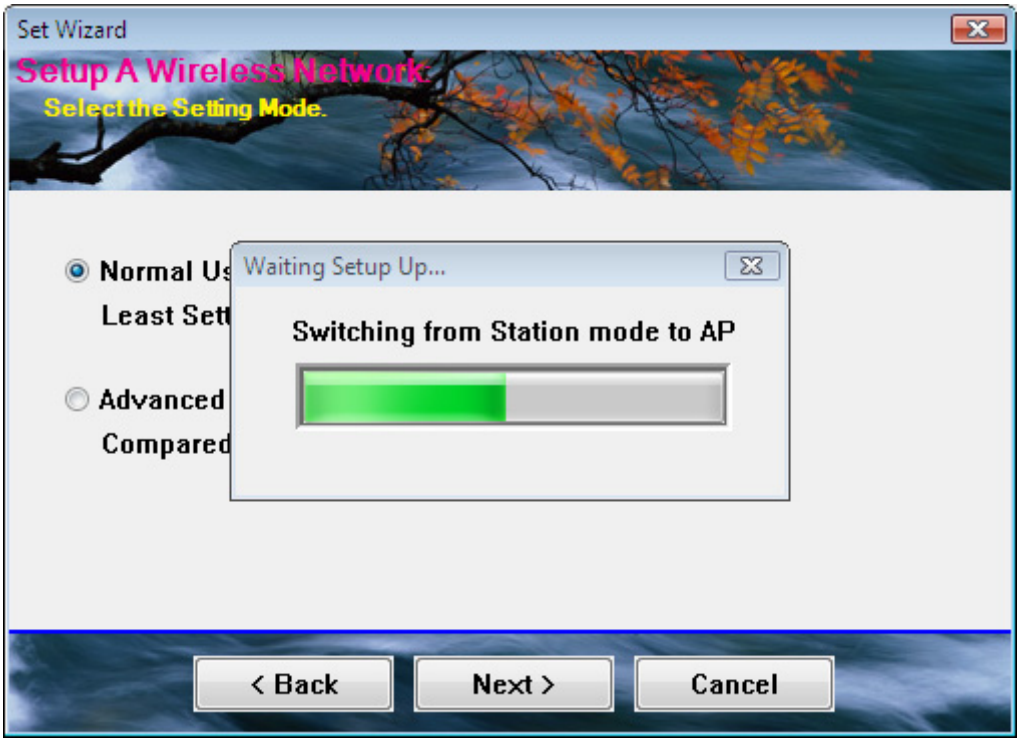
When clicking the refresh menu, you can update and re-enumerate the contents of adapter list area.

2. Set Wizard(S)

2.1 Wizard-1

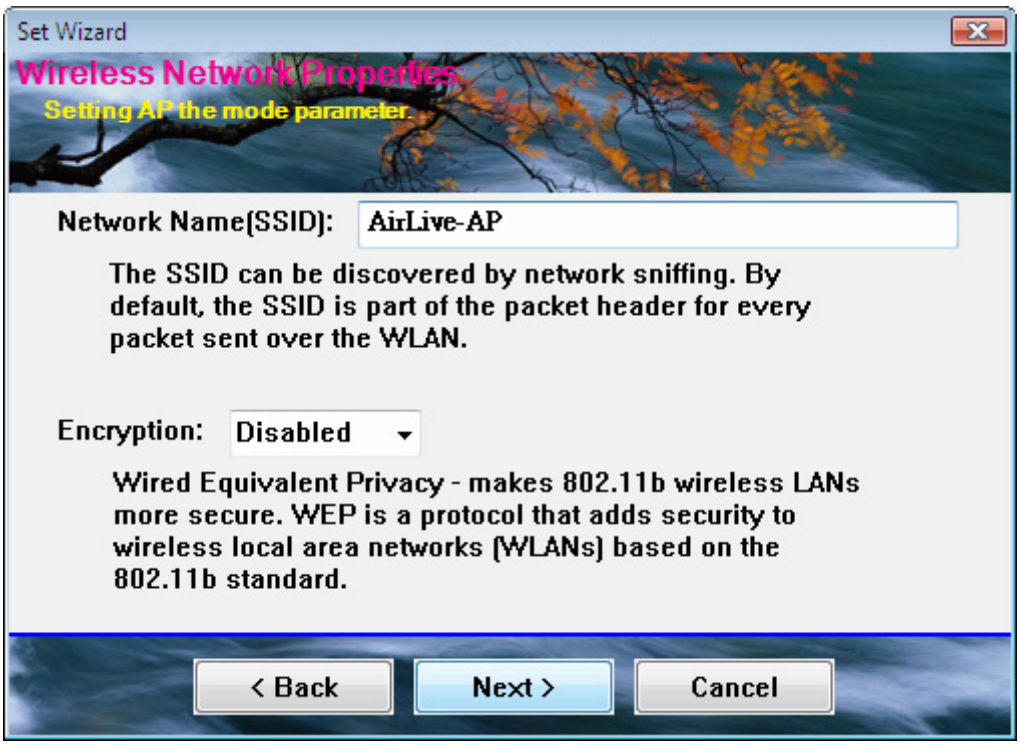
Click Set Wizard(S) menu to enter operation wizard. Click AP: Setup a wireless network. To configure Access Point parameters.





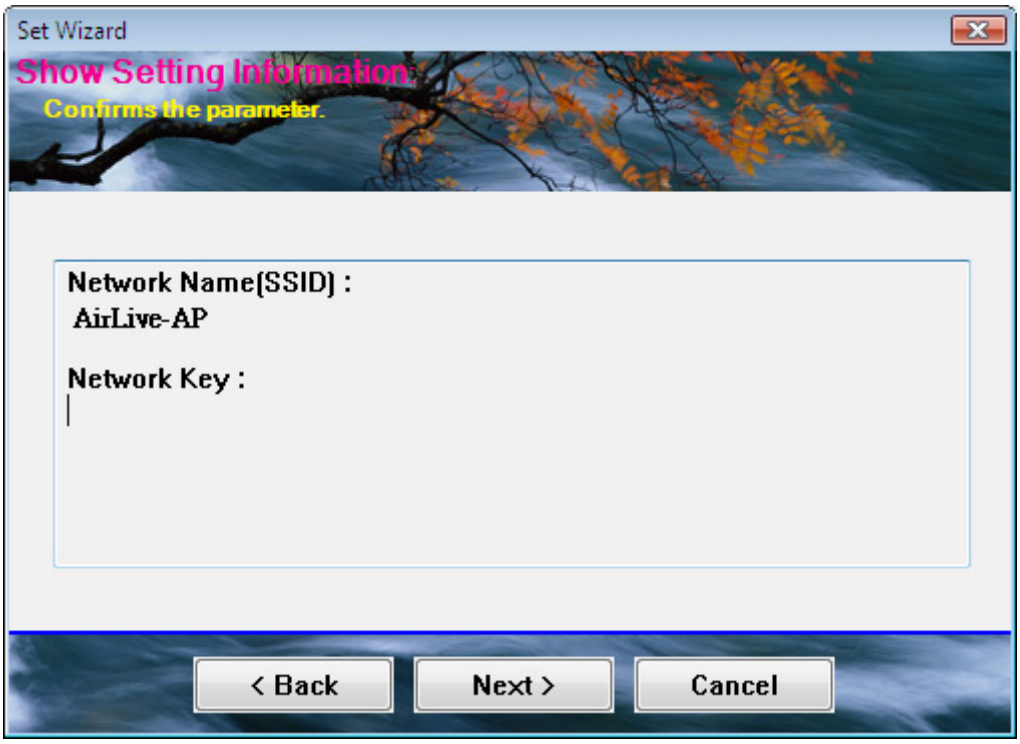
2.2 Wizard-2

User defines wireless network Name [SSID](less than 32 characters). User may skip wireless security. Strongly recommend user to setup wireless security to avoid invalid users.


Set Wizard
Wireless Network Properties:
Setting AP the mode parameter.
Network Name(SSID):
AirLive-AP
The SSID can be discovered by network sniffing. By default, the SSID is part of the packet header for every packet sent over the WLAN.
Encryption:
Disabled
Wired Equivalent Privacy - makes 802.11b wireless LANs more secure. WEP is a protocol that adds security to wireless local area networks (WLANs) based on the 802.11b standard.
< Back
Next >
Cancel

2.3 Wizard-3

This page shows SSID & Security settings.

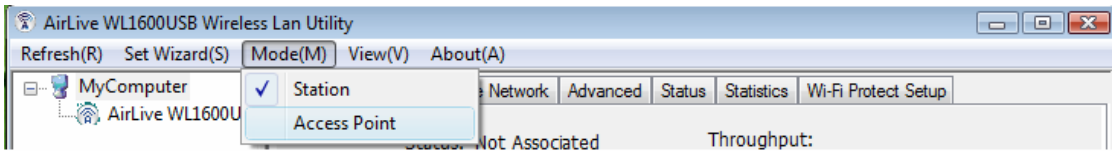


2.4 Wizard-4

Show all settings under AP mode. Click Finish to complete wizard setup.

3. Mode (M)

Wireless configuration is quickly switched to either [Station] or [AP].

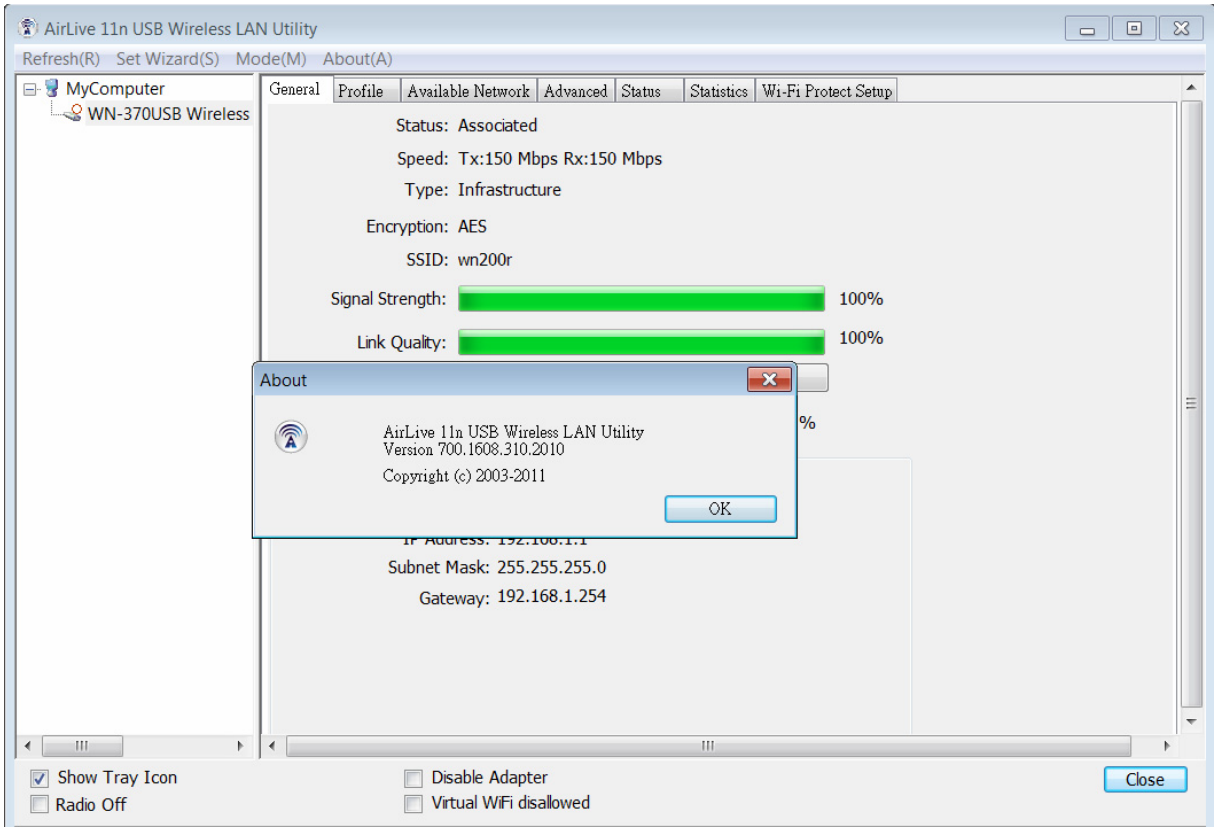


4. View (V)

Enable/disable the presence of E. Status Bar. Without the check mark (v) the E. Status Bar will be hidden.

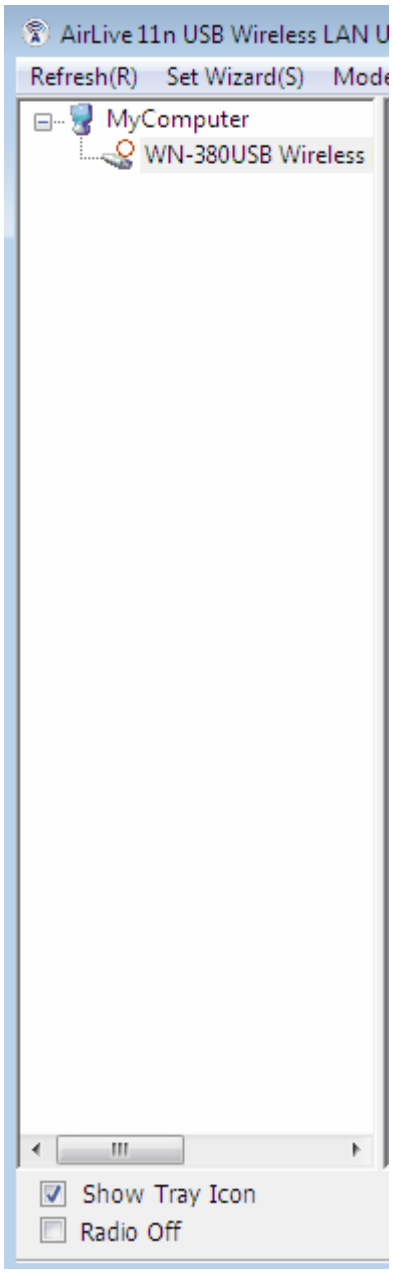
5. About (A)

Click the “About” to show the utility information dialog. The application version and license information are shown in utility information dialog.



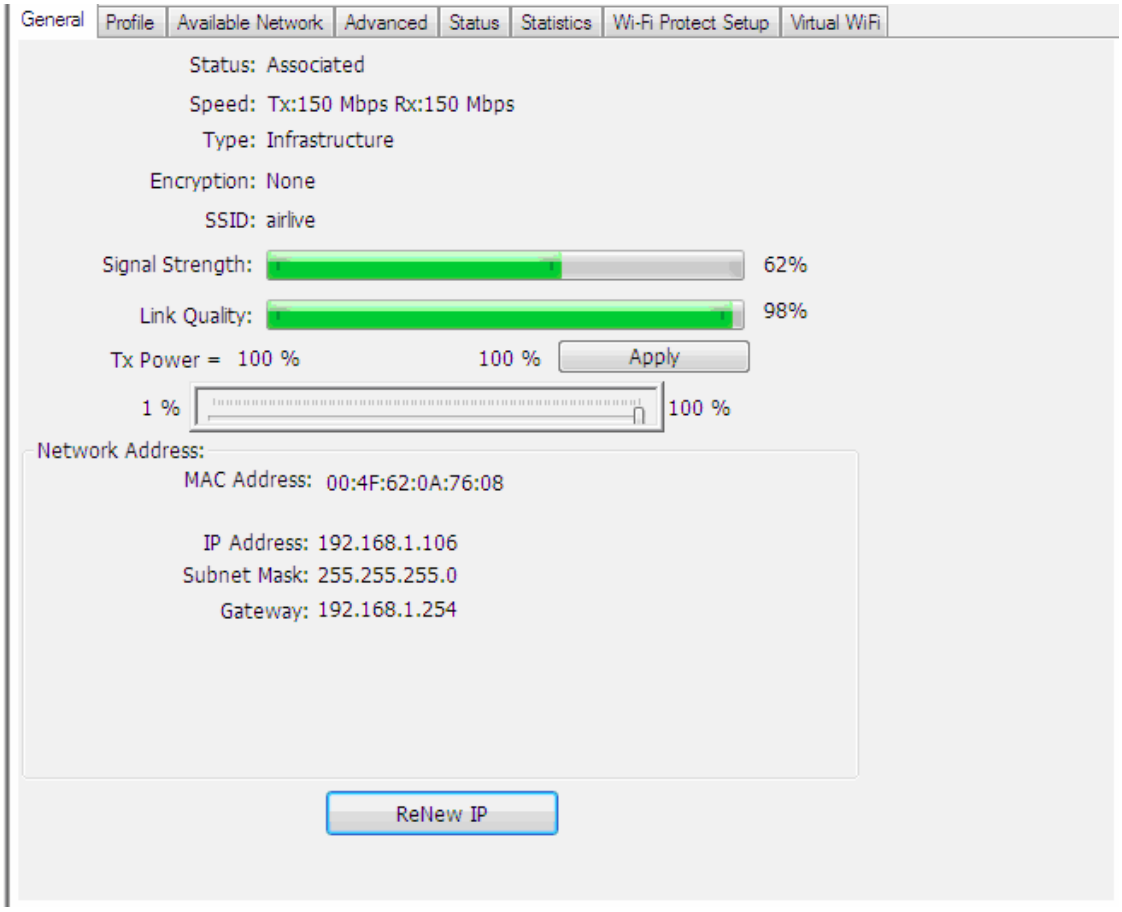
B. Adapter List Area

All connected adapters on this system with multiple adapter installations are displayed in this area. It is easy for users to change the selected adapter by one click. The contents of properties area are dependant on wireless configuration that the selected adapter is set up. If only single adapter is installed on the system, only one adapter is always selected.

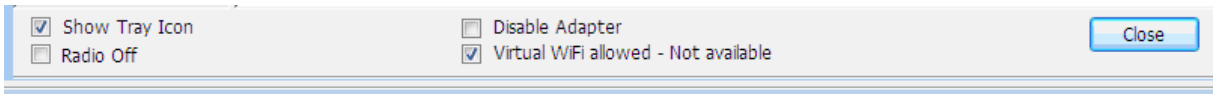


C. Properties Area

The contents of this area are dependent on current wireless configuration. The current configuration is determined on previous explanation of submenu “Mode”. The more detailed contents are described in the following wireless configuration sections for both Station and AP mode.



D. Global Control Bar

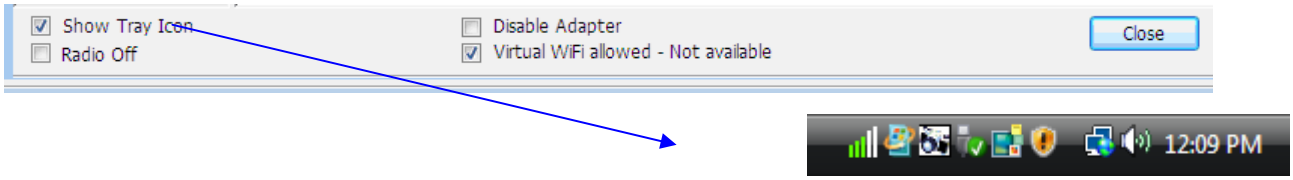


Each control item on this bar affects the adapter or management GUI directly.

Show Tray Icon

Checking "Show Tray Icon" and clicking “Close” button, the management GUI will be

minimized and stay on the tray icon which is located at the right bottom corner of Windows. If not, management GUI will shut down while clicking "Close" button with unchecked condition

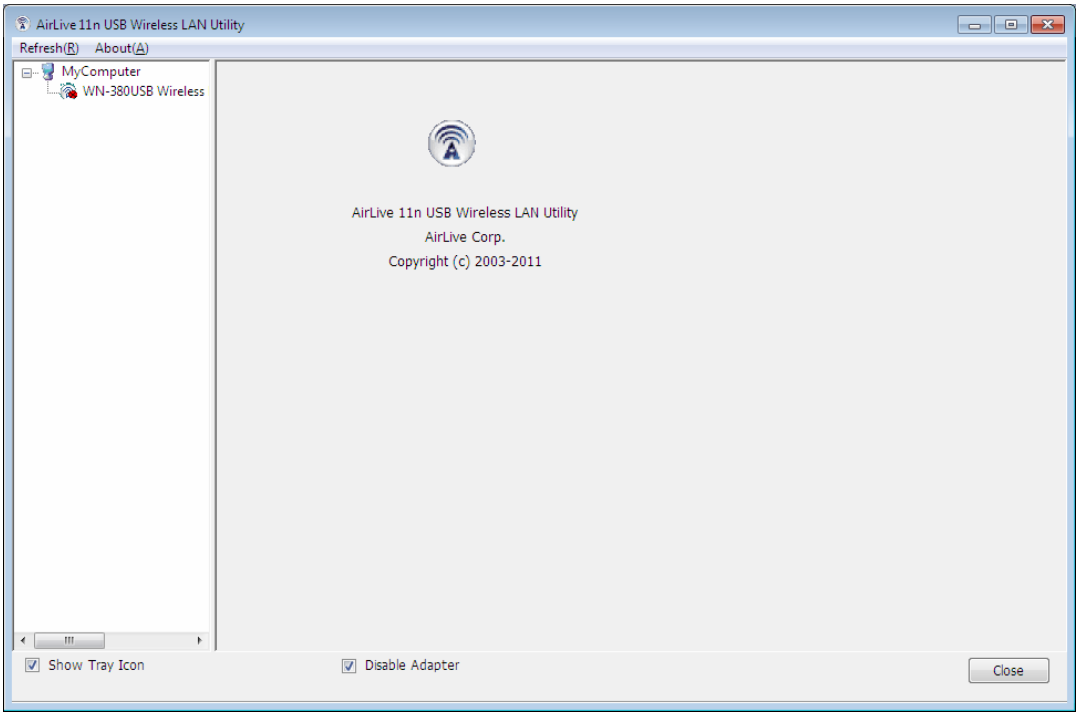


Radio Off

Turn off the radio to save power. While the radio is off, the links with other wireless network nodes are disconnected. User should be aware that while the wireless configuration is in AP mode. The radio off will cause the sub network which belongs to the AP to be disconnected with internet/intranet.

Disable Adapter

Stop wireless USB device.

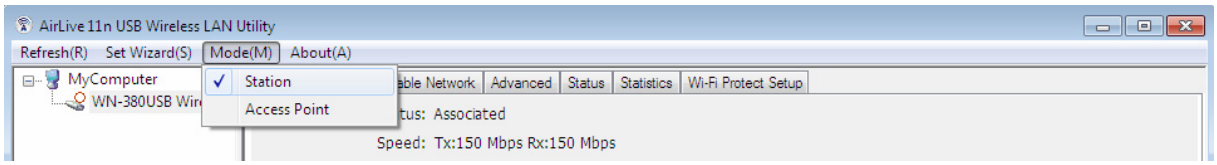


E. Status Bar

The hints or status of the management GUI are presented in the status bar.

4.2 Station Mode

The following explanations focus on the properties area.

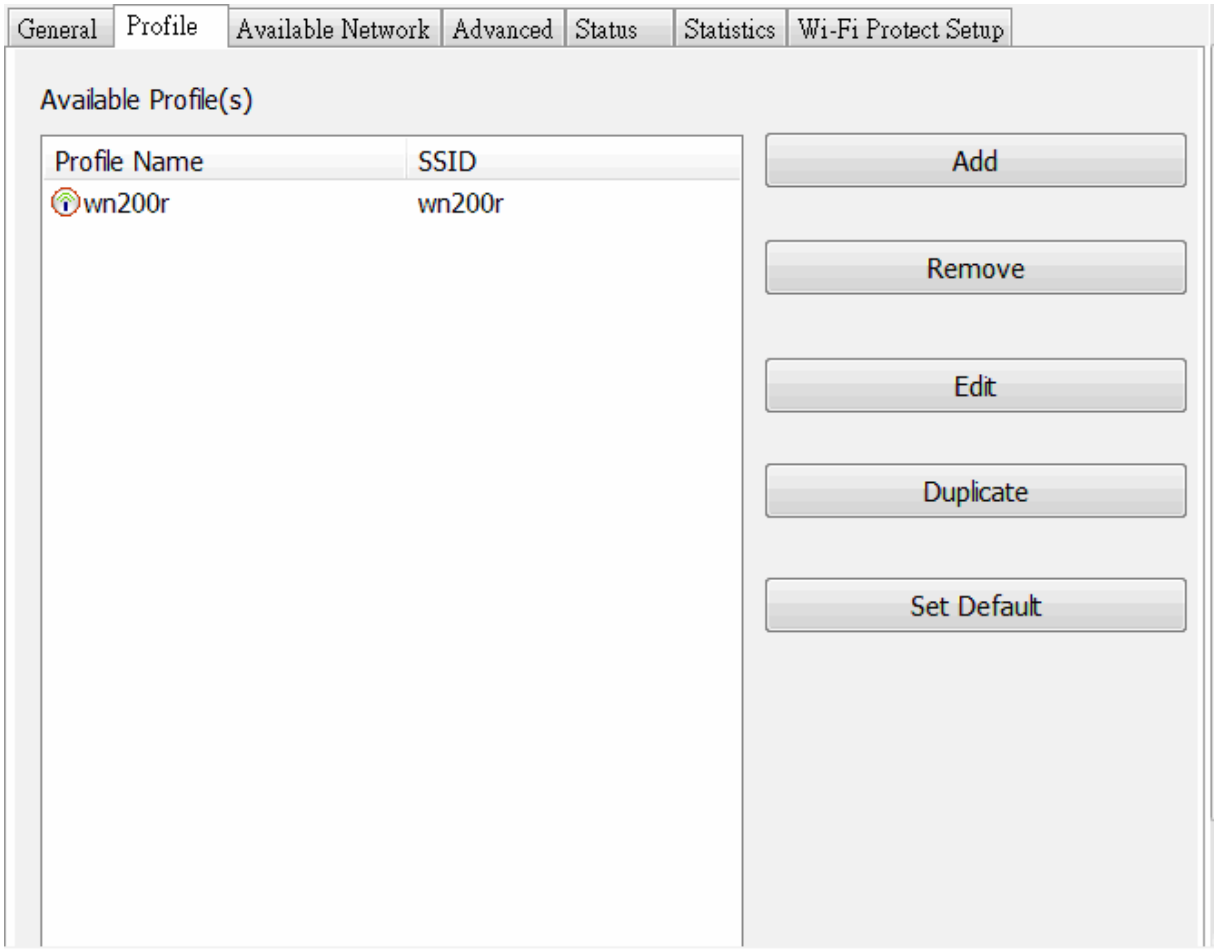


Infrastructure and Ad-Hoc

With both Infrastructure and Ad-Hoc types, the properties should look like the picture above. Six property pages present different information of current wireless network status. Please read the following explanations before you reviewing these pages, it could help you to well understand the wireless environment around the system. It is easy to use to switch property pages just by clicking left button of mouse on the title of each page. The following six sections describe detailed information of each page.

A. General Page

This page represents the general information of this adapter.



1. Status

The status of station connection to AP.

2. Speed

Current transition speed in Mbps (Mega-Bits-Per-Second).

3. Type

Current wireless LAN configuration type.

4. Encryption

Current encryption mode used.

5. SSID

Name of wireless network.

6. Signal Strength

The average signal quality of packets received from wireless network.

We recommend connecting AP with over 70% signal strength.

7. Throughput Diagram

Current throughput, including transmission (Tx) and total traffic (Total).

8. Network Address

Mac Address: six two-digital number of this Wireless LAN USB adapter

IP Address: assigned network address by DHCP server or self-definition in four three-digital number format.

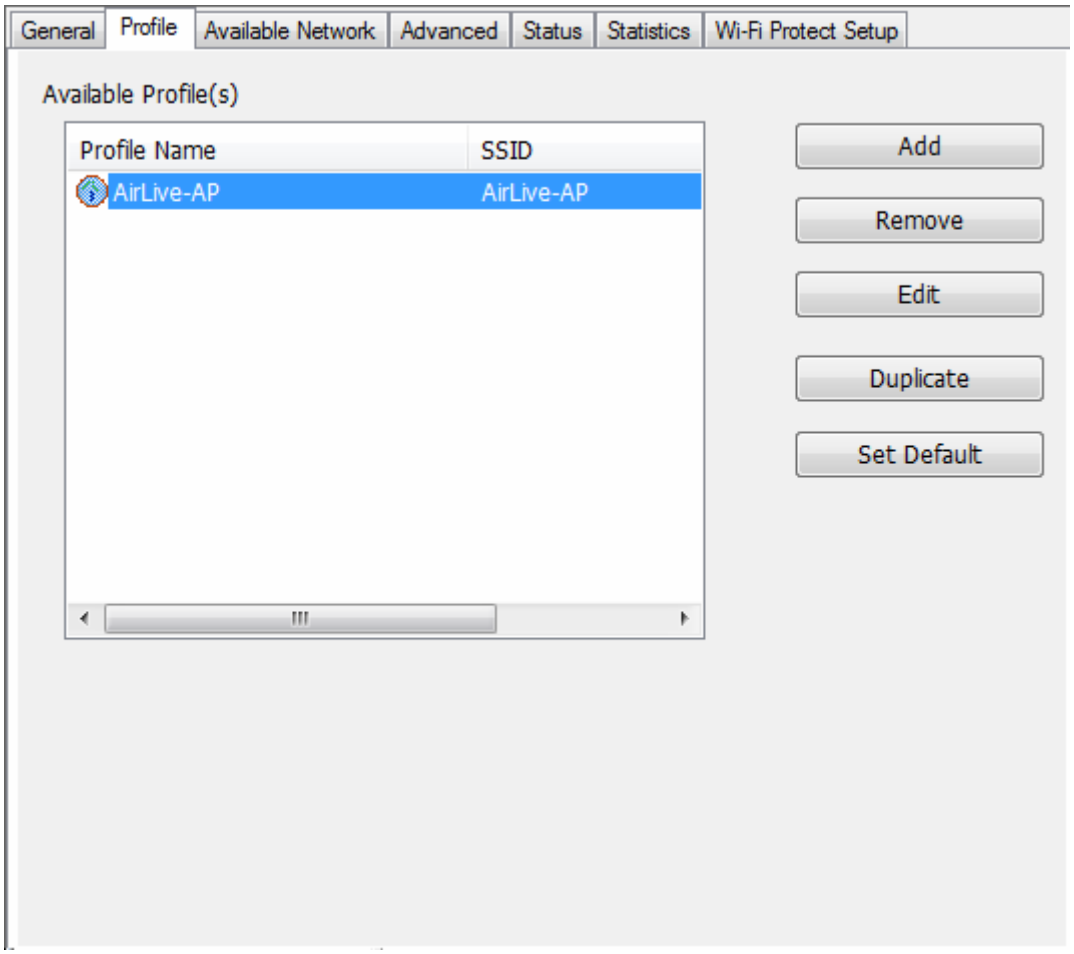
- Subnet Mask: the only valid value is 2555.255.255.0
- Gateway: It comes from connected AP. Your system can not connect internet with this field empty.

B. Profile Page

This page provides profiles management such as add, remove, edit and duplicate just by pressing the respected button.

Available Profile(s)

The list box shows all the created profiles.



1. Add

Add a new profile for AP or IBSS (Ad-Hoc mode).

2. Remove

Remove the selected profile.

3. Edit

Edit contents of selected profile.

4. Duplicate

Make copy of selected profile.

5. Set Default

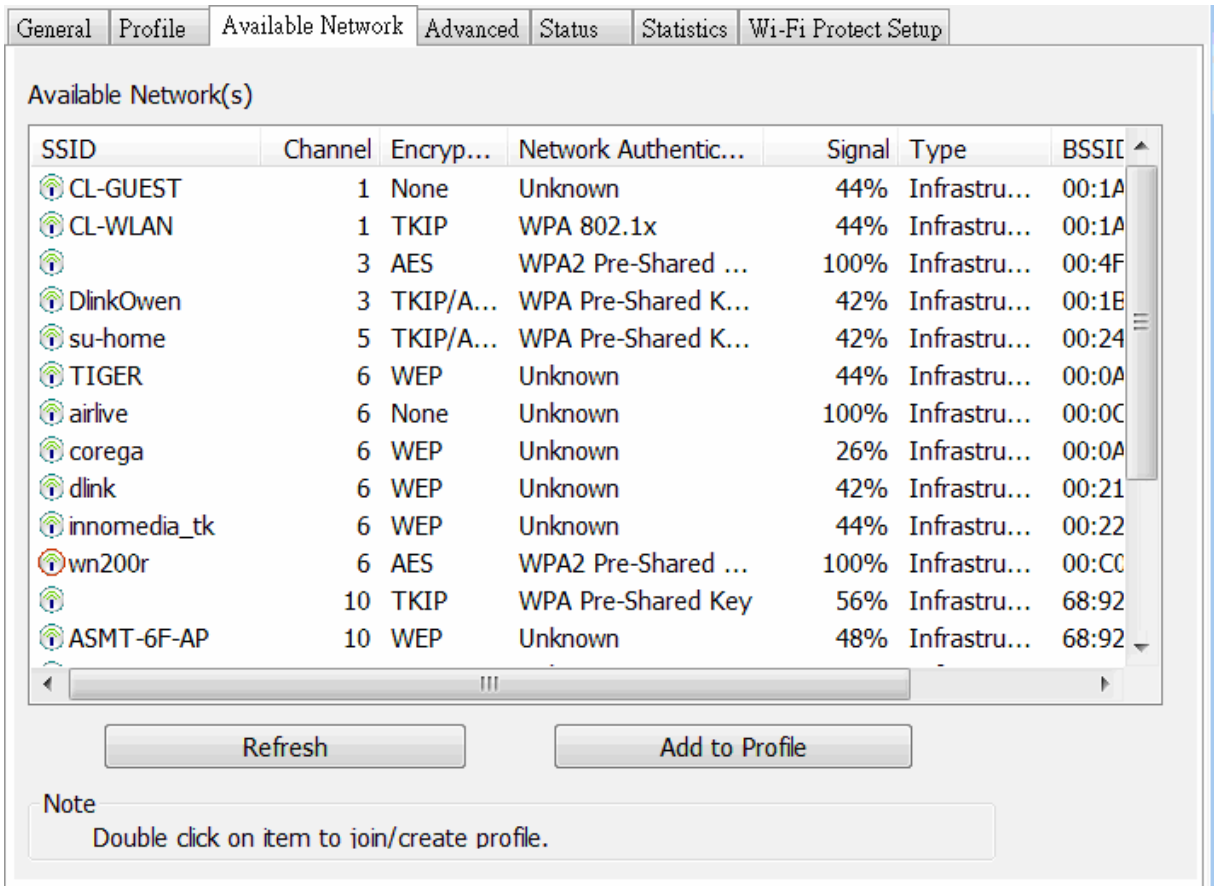
Set the selected profile as default selection.

6. Available Network Page

This page presents all BSS, including AP and IBSS, around this system. You can pick any one of these network connections.

C. Available Network(s)

Show network connection around this system


General
Profile
Available Network
Advanced
Status
Statistics
Wi-Fi Protect Setup
Available Network(s)
SSID Channel Encryp... Network Authentic... Signal Type BSSID
CL-GUEST 1 None Unknown 44% Infrastru... 00:1A
CL-WLAN 1 TKIP WPA 802.1x 44% Infrastru... 00:1A
3 AES WPA2 Pre-Shared ... 100% Infrastru... 00:4F
DlinkOwen 3 TKIP/A... WPA Pre-Shared K... 42% Infrastru... 00:1E
su-home 5 TKIP/A... WPA Pre-Shared K... 42% Infrastru... 00:24
TIGER 6 WEP Unknown 44% Infrastru... 00:0A
airlive 6 None Unknown 100% Infrastru... 00:0C
corega 6 WEP Unknown 26% Infrastru... 00:0A
dlink 6 WEP Unknown 42% Infrastru... 00:21
innomedia_tk 6 WEP Unknown 44% Infrastru... 00:22
wn200r 6 AES WPA2 Pre-Shared ... 100% Infrastru... 00:C0
10 TKIP WPA Pre-Shared Key 56% Infrastru... 68:92
ASMT-6F-AP 10 WEP Unknown 48% Infrastru... 68:92
Refresh
Add to Profile
Note
Double click on item to join/create profile.

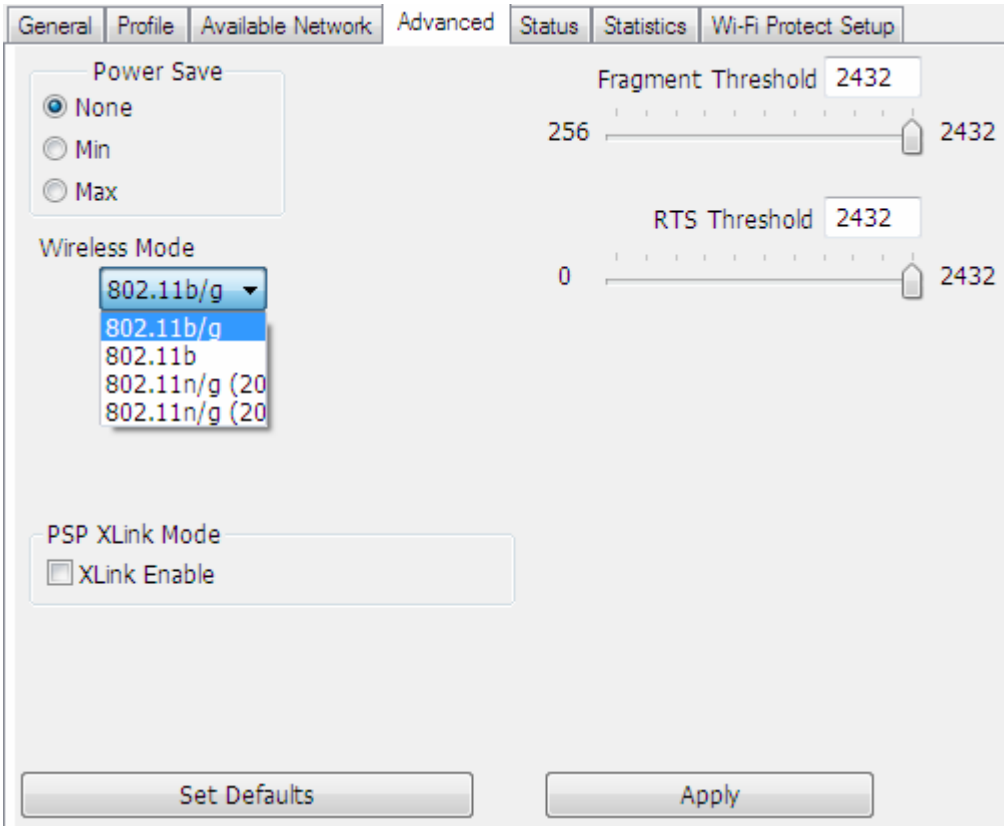
1. Refresh

Rescan network connection around this system.

2. Add to Profile

Create profile for selected network connection and add it to profile list.

C. Advanced Page



1. Power Save

None: without power save function.

Min: wake up more frequently to receive packets.

Max: wake up less frequently to receive packets.

2. Wireless Mode

802.11b

802.11g/b

3. 802.11b Preamble Mode

Long: higher quality but with lower performance than preamble short mode.

Short: Normal quality but with higher performance than preamble long mode.

Auto: use the preamble mode of current.

4. Fragment Threshold

The threshold of fragment length. Higher threshold increase data transition performance with good signal quality. However, in a poor signal quality environment, data throughput might be worse on high fragment threshold than low fragment threshold.

5. RTS Threshold

Threshold of Request To Send mechanism. The RTS frame will not send out until the packet size over threshold.

6. WOL (Wake On LAN)

The wake-on-LAN is applied for remote control purpose. You could wake up a system through network packets. For Wireless LAN USB Adapter, only the same adapter on another system could wake it up. Input MAC Address: the six two-digit numbers of Wireless LAN USB Adapter on target system.

Wake Up: click this button to wake it up .

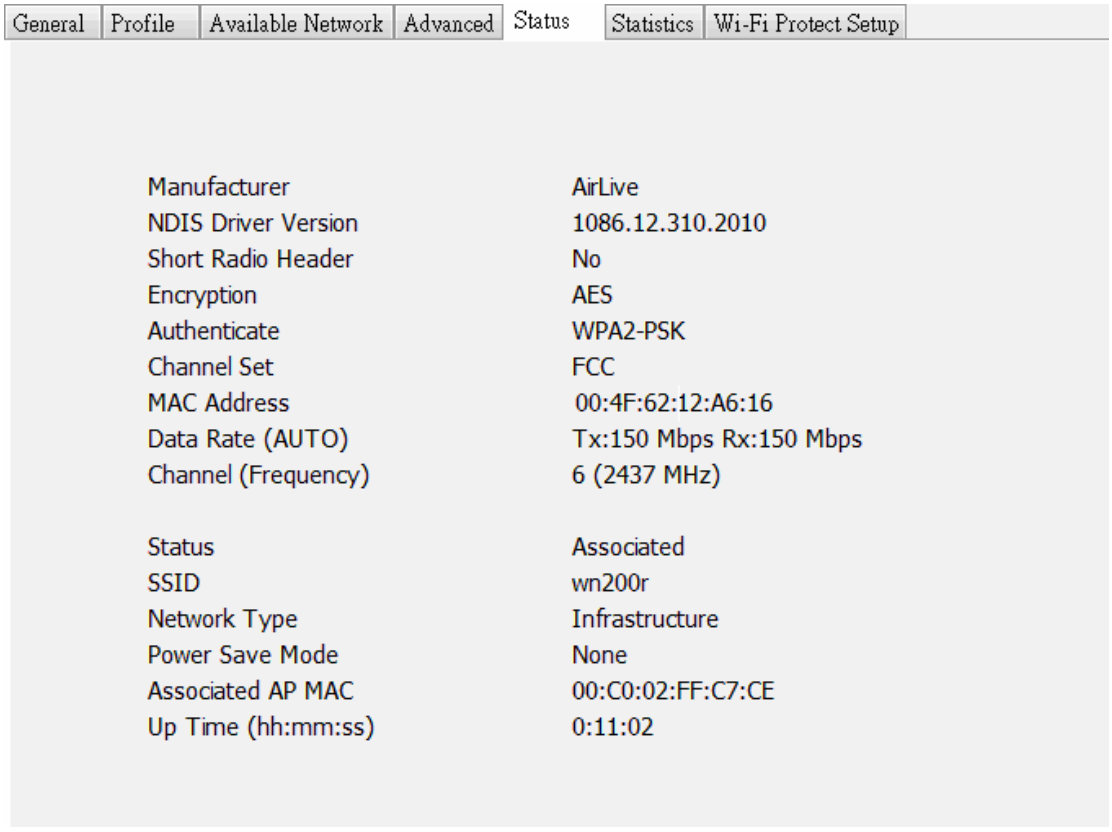
7. Set Defaults

Restore the default value to be current settings.

8. Apply

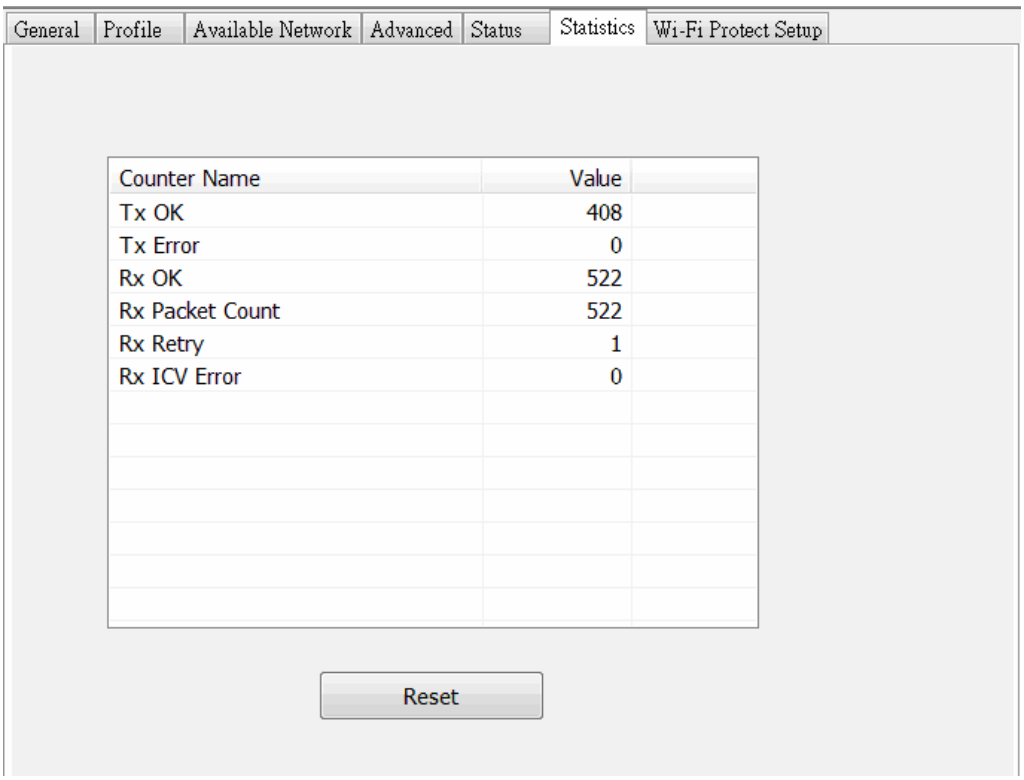
Apply the current settings to GUI.

D. Status Page



1. NDIS Driver Version
Driver version
2. Short Radio Header
Yes
3. Encryption
Current encryption mode.
4. Authenticate
Authentication state
5. Channel Set
Selected channel plan currently.
6. MAC Address
MAC address of this adapter.
7. Data Rate
Wireless LAN transition speed
8. Channel(Frequency)
Current channel number
9. Status
Wireless network status
10. SSID
Name of connecting AP
11. Network Type
Indicate current network configuration type
12. Power Save Mode
Current setting power save mode
13. Associated AP MAC
MAC address of connecting AP
14. Up Time(hh:mm:ss)
Total connection time

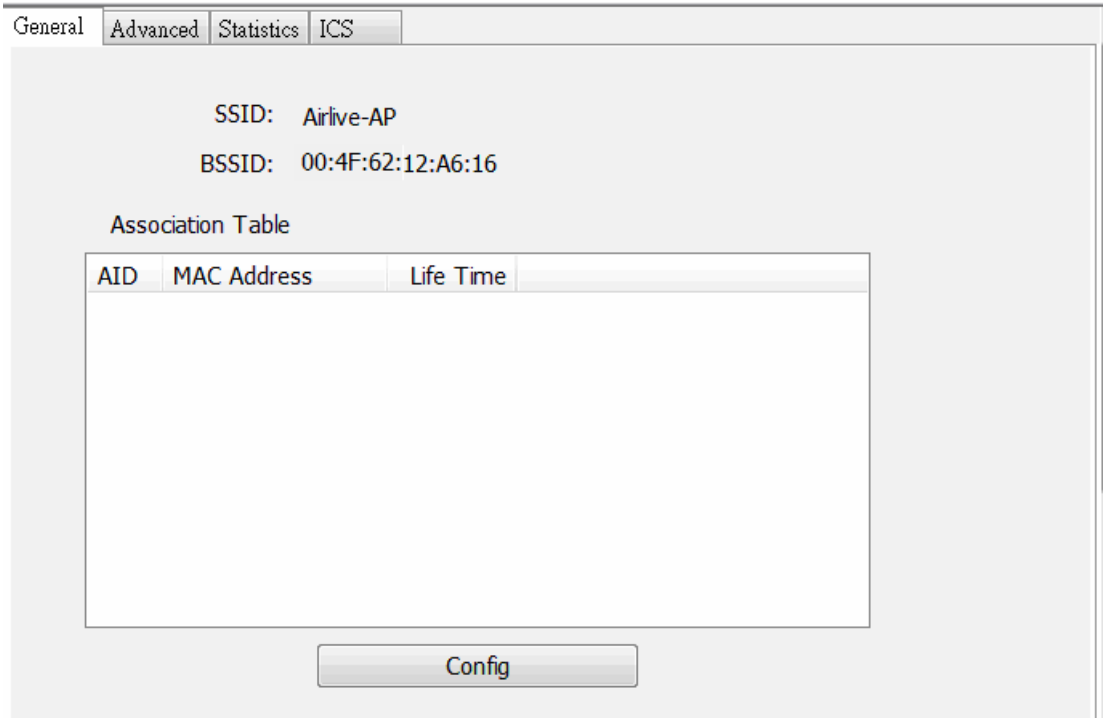
F. Statistics Page
You could watch the Tx/Rx status of current wireless connection. This page shows a statistic analysis of packet transition.



4.3 Access Point Mode

A. General Page

This page provides general information of this AP, including name, MAC address and list of joined stations.



1. SSID

The name of this AP.

2. BSSID

Six two-digital numbers of the MAC address of this AP.

3. Association Table

It is the list of joined stations to this AP.

4. AID (Association ID)

The AID field is a value assigned by an AP during association that represents 16-bit ID of a station. It is a unique value assigned by AP.

5. MAC address

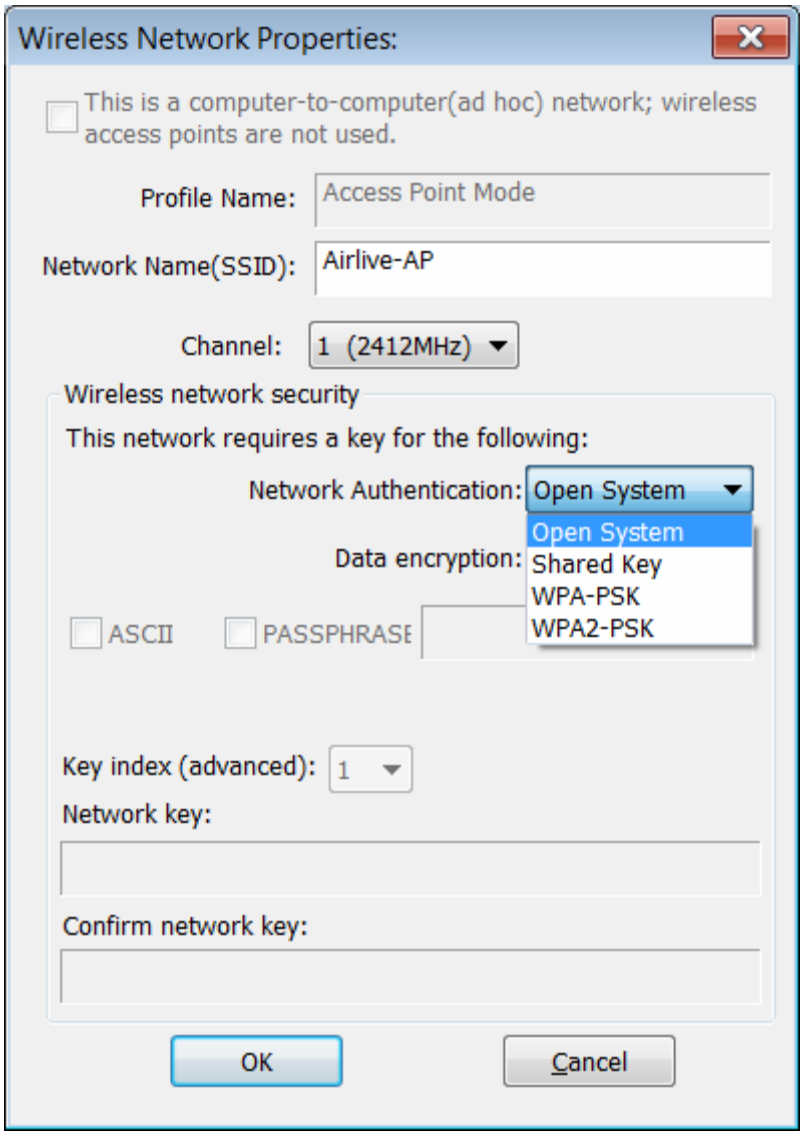
It is the six two-digit numbers that assemble the MAC address of respected joined station.

6. Life Time

It is the timer that counts down from 10 minutes whenever the AP connects the station successfully. If an STA associated to SW AP does not have any interaction with the AP in 10 minutes, it will be disassociated from the Infra-structure BSS.

7. Config

A dialog of this AP is shown for configuration modification.



7.1. Network Name (SSID)

Name of the AP searchable by other wireless nodes. The length of SSID should be shorter than 32 characters.

7.2. Channel

Select the wireless channel within current channel plan.

7.3. Network Authentication & Data Encryption

There are three types of authentication:

- Open System

It is combined with data encryption type to be WEP or to be disabled.

Encryption ~ disabled: you decide to open this AP to every one without network authentication.

Encryption ~ WEP: you decide to setup the basic data encryption with a defined network key.

- Shared Key + WEP

You decide to apply both authentication and data encryption to prevent unauthorized login.

- WPA-PSK + TKIP & WPA2-PSK + TKIP

The most advanced authentication and data encryption that provide the best security protection.

7.4. ASCII/ PASSPHRASE

The most advanced authentication and data encryption that provide the best security protection.

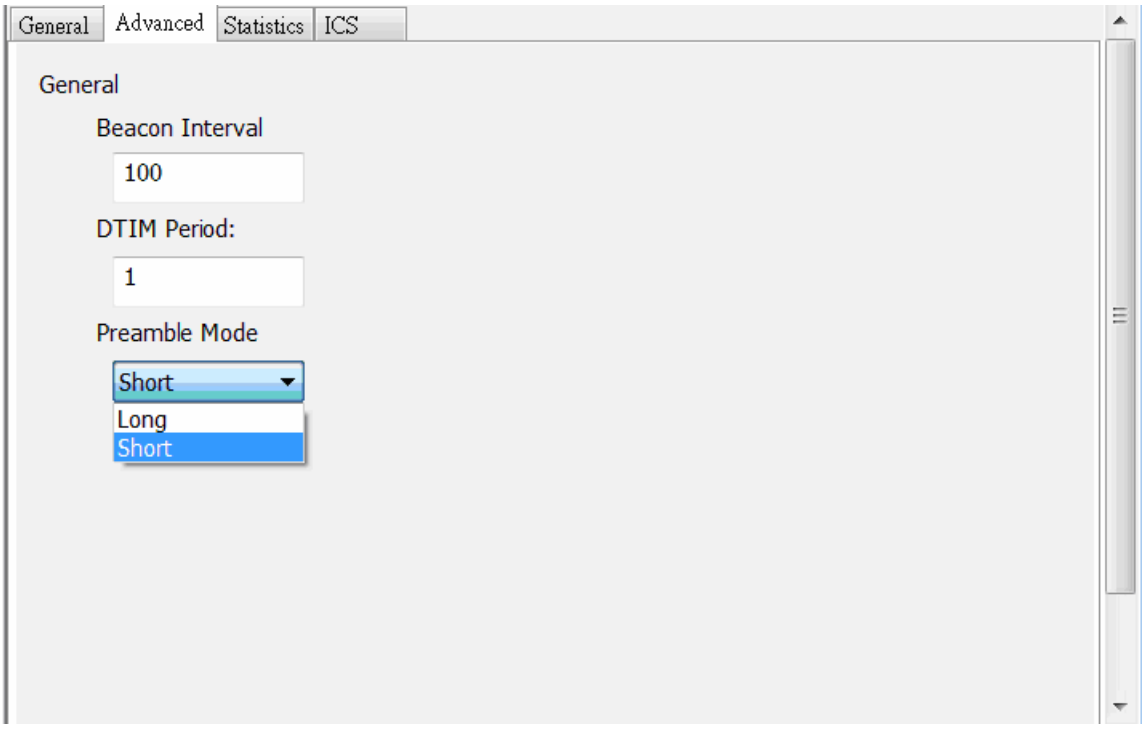
- ASCII: You should provide either 5 or 13 ASCII characters on Network key edit box.
- PASSPHRASE: You could input words on Network Key edit box.
  64 bits: The generated pass key is 64-bit to be complied with data packets.
  128 bits: The generated pass key is 128-bit to be complied with data packets.
- Hexadecimal: While both ASCII and PASSPHRASE are not checked, you should input hexadecimal number in the network key box. For example, 10 digits hex number for 64-bit WEP or 26 digits hex number for 128-bit WEP.

7.5. Key index (1 ~4)

At most four key index to represent the opposite network key.

B. Advanced Page

Users could setup the advanced characteristics of network packet for transmission on this page.



1. Beacon Interval

This filed indicates the interval between each beacon that this AP sends out in unit of TU (1024 micro-seconds).

2. DTIM Period

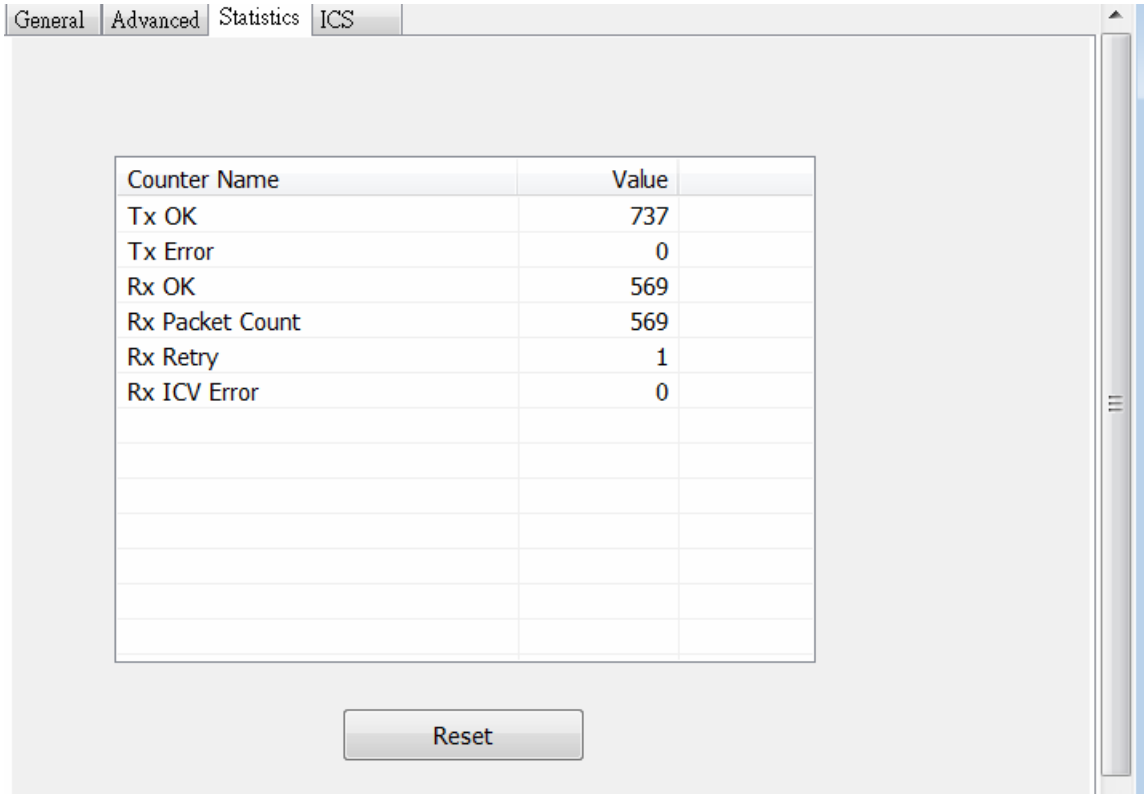
The DTIM Period field is the number of Beacon intervals between successive DTIMs.

3. Preamble Mode

- Long: higher quality but with lower performance than preamble short mode.
- Short: Normal quality but with higher performance then preamble long mode.

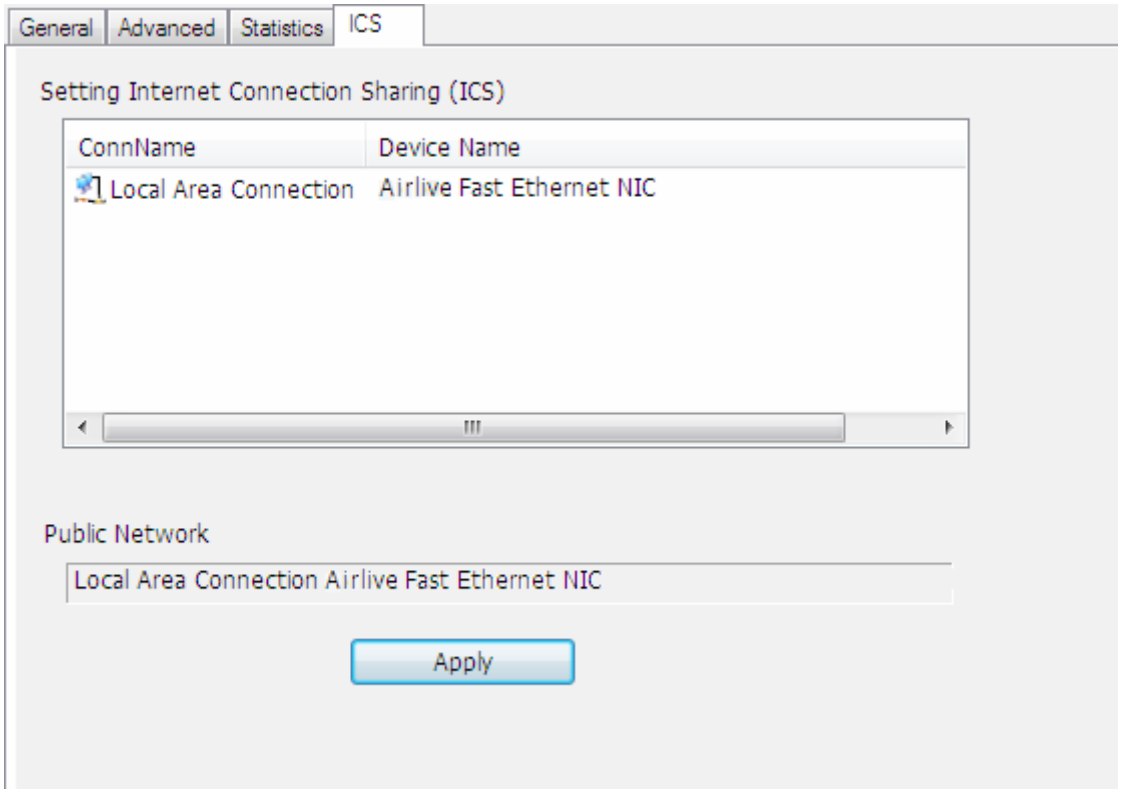
C. Statistics Page

The Tx/Rx status of current wireless connection is shown. A statistic analysis of packet transition is listed.



E. ICS Page

F.



1. ConnName

List all network connections to this system. You can pick up one from the listed item(s) whose network domain you would want to connect to.

2. Apply

Execute the current settings.

5 Appendix

5.1 Troubleshooting

Q: The LED is off. **A:** Make sure the PC Card is inserted properly. Otherwise contact your vendor.
Q: The LED is always on not blinking. **A:** Make sure that you have installed the driver from attached CD. Otherwise contact your vendor.
Q: The LED is blinking but the PC Card icon does not appear in your icon tray. **A:** Make sure that you have installed the Utility from the attached CD.
Q: The PC Card is linking, but can't share files with others. **A:** Make sure the **file and printer sharing** function is enabled. You can enable the function by checking the icon of **My Computer -> Control Panel -> Network -> file and printer sharing -> I want to be able to give others to access to my files**.
Q: Slow or poor performance under AP mode **A:** Try to select another channel for the communicating group or move your device closer to the Access Point.

5.2 Glossary

IEEE 802.11 Standard

The IEEE 802.11 Wireless LAN standards subcommittee, which is formulating a standard for the industry.

Access Point

An internetworking device that seamlessly connects wired and wireless networks together.

Ad Hoc

An Ad Hoc wireless LAN is a group of computers, each with a WLAN adapter, connected as an independent wireless LAN

Ad Hoc wireless LAN is applicable at a departmental scale for a branch or SOHO operation.

BSSID

A specific Ad Hoc LAN is called a Basic Service Set (BSS). Computers in a BSS must be configured with the same BSSID.

DHCP

Dynamic Host Configuration Protocol - a method in which IP addresses are assigned by server dynamically to clients on the network. DHCP is used for Dynamic IP Addressing and requires a dedicated DHCP server on the network.

Direct Sequence Spread Spectrum

This is the method the wireless cards use to transmit data over the frequency spectrum. The other method is frequency hopping. Direct sequence spreads the data over one frequency range (channel) while frequency hopping jumps from one narrow frequency band to another many times per second.

ESSID

An Infrastructure configuration could also support roaming capability for mobile workers. More than one BSS can be configured as an Extended Service Set (ESS). Users within an ESS could roam freely between BSSs while served as a continuous connection to the network wireless stations and Access Points within an ESS must be configured with the same ESSID and the same radio channel.

Ethernet

Ethernet is a 10/100Mbps network that runs over dedicated home/office wiring. Users must be wired to the network at all times to gain access.

Gateway

A gateway is a hardware and software device that connects two dissimilar systems, such as a LAN and a mainframe. In Internet terminology, a gateway is another name for a router. Generally a gateway is used as a funnel for all traffic to the Internet

IEEE

Institute of Electrical and Electronics Engineers Infrastructure. An integrated wireless and wired LAN is called an Infrastructure configuration. Infrastructure is applicable to enterprise scale for wireless access to central database, or wireless

ISM Band

The FCC and their counterparts outside of the U.S. have set aside bandwidth for unlicensed use in the so-called ISM (Industrial, Scientific and Medical) band. Spectrum in the vicinity of 2.4 GHz, in particular, is being made available (Industrial, Scientific and Medical) band. Spectrum in the vicinity of 2.4 GHz, in particular, is being made available of users around the globe.

Local Area Network (LAN)

A LAN is a group of computers, each equipped with the appropriate network adapter card connected by cable/air, that share applications, data, and peripherals. All connections are made via cable or wireless media, but a LAN does not use telephone services. It typically spans a single building or campus.

Network

A network is a system of computers that is connected. Data, files, and messages can be transmitted over this network. Networks may be local or wide area networks.

Protocol

A protocol is a standardized set of rules that specify how a conversation is to take place, including the format, timing, sequencing and/ or error checking.

SSID

A Network ID unique to a network. Only clients and Access Points that share the same SSID are able to communicate with each other. This string is case-sensitive.

Static IP Addressing

A method of assigning IP addresses to clients on the network. In networks with Static IP address, the network administrator manually assigns an IP address to each computer. Once a Static IP address is assigned, a computer uses the same IP address every time it reboots and logs on to the network, unless it is manually changed.

Temporal Key Integrity Protocol (TKIP)

The Temporal Key Integrity Protocol, pronounced tee-kip, is part of the IEEE 802.11i encryption standard for wireless LANs. TKIP is the next generation of WEP, the Wired Equivalency Protocol, which is used to secure 802.11 wireless LANs. TKIP provides per-packet key mixing, a message integrity check and a re-keying mechanism, thus fixing the flaws of WEP.

Transmission Control Protocol / Internet Protocol (TCP/IP)

TCP/IP is the protocol suite developed by the Advanced Research Projects Agency (ARPA). It is widely used in corporate Internet works, because of its superior design for WANs. TCP governs how packet is sequenced for transmission the network. The term “TCP/IP” is often used generically to refer to the entire suite of related protocols.

Transmit / Receive

The wireless throughput in Bytes per second averaged over two seconds.

Wi-Fi Alliance

The Wi-Fi Alliance is a nonprofit international association formed in 1999 to certify interoperability of wireless Local Area Network products based on IEEE 802.11 specification. The goal of the Wi-Fi Alliance's members is to enhance the user experience through product interoperability. The organization is formerly known as WECA.

Wi-Fi Protected Access (WPA)

The Wi-Fi Alliance put together WPA as a data encryption method for 802.11 wireless LANs. WPA is an industry-supported, pre-standard version of 802.11i utilizing the Temporal Key Integrity Protocol (TKIP), which fixes the problems of WEP, including using dynamic keys.

Wide Area Network (WAN)

A WAN consists of multiple LANs that are tied together via telephone services and / or fiber optic cabling. WANs may span a city, a state, a country, or even the world

Wired Equivalent Privacy (WEP)

Now widely recognized as flawed, WEP was a data encryption method used to protect the transmission between 802.11 wireless clients and APs. However, it used the same key among all communicating devices. WEP's problems are well-known, including an insufficient key length and no automated method for distributing the keys. WEP can be easily cracked in a couple of hours with off-the-shelf tools.

Wireless LAN (WLAN)

A wireless LAN does not use cable to transmit signals, but rather uses radio or infrared to transmit packets through the air. Radio Frequency (RF) and infrared are the commonly used types of wireless transmission. Most wireless LANs use spread spectrum technology. It offers limited bandwidth, usually under 11Mbps, and users share the bandwidth with other devices in the spectrum; however, users can operate a spread spectrum device without licensing from the Federal Communications Commission (FCC).

Fragment Threshold

The proposed protocol uses the frame fragmentation mechanism defined in IEEE 802.11 to achieve parallel transmissions. A large data frame is fragmented into several fragments each of size equal to fragment threshold. By tuning the fragment threshold value, we can get varying fragment sizes. The determination of an efficient fragment threshold is an important issue in this scheme. If the fragment threshold is small, the overlap part of the master and parallel transmissions is large.

This means the spatial reuse ratio of parallel transmissions is high. In contrast, with a large fragment threshold, the overlap is small and the spatial reuse ratio is low. However high fragment threshold leads to low fragment overhead. Hence there is a trade-off between spatial re-use and fragment overhead. Fragment threshold is the maximum packet size used for fragmentation. Packets larger than the size programmed in this field will be fragmented If you find that your corrupted packets or asymmetric packet reception (all send packets, for example). You may want to try lowering your fragmentation threshold. This will cause packets to be broken into smaller fragments. These small fragments, if corrupted, can be resent faster than a larger fragment. Fragmentation increases overhead, so you'll want to keep this value as close to the maximum value as possible.

RTS (Request To Send) Threshold

The RTS threshold is the packet size at which packet transmission is governed by the RTS/CTS transaction. The IEEE802.11-1997 standard allows for short packets to be transmitted without RTS/CTS transactions. Each station can have a different RTS threshold. RTS/CTS is used when the data packet size exceeds the defined RTS threshold. With the CSMA/CA transmission mechanism, the transmitting station sends out an RTS packet to the receiving station, and waits for the receiving station to send back a CTS (Clear to Send) packet before sending the actual packet data. This setting is useful for networks with many clients. With many clients, and a high network load, there will be many more collisions. By lowering the RTS threshold, there may be fewer collisions, and performance should improve. Basically, with a faster RTS threshold, the system can recover from problems faster. RTS packets consume valuable bandwidth, however, so setting this value too low will limit performance.

Beacon Interval

In addition to data frames that carry information from higher layers, 802.11 include management and control frames that support data transfer. The beacon frame, which is a type of management frame, provides the "heartbeat" of a wireless LAN, enabling stations to establish and maintain communications in an orderly fashion. Beacon Interval represents the amount of time between beacon transmissions. Before a station enters power save mode, the station needs the beacon interval to know when to wake up to receive the beacon (and learn whether there are buffered frames at the access point).

Preamble Type

There are two preamble types defined in IEEE 802.11 specification. A long preamble basically gives the decoder more time to process the preamble. All 802.11 devices support a long preamble. The short preamble is designed to improve efficiency (for example, for VoIP systems). The difference between the two is in the Synchronization field. The long preamble is 128 bits, and the short is 56 bits.

WPA2

It is the second generation of WPA. WPA2 is based on the final IEEE 802.11i amendment to the 802.11 standard.

Temporal Key Integrity Protocol (TKIP)

The Temporal Key Integrity Protocol, pronounced tee-kip, is part of the IEEE 802.11i encryption standard for wireless LANs. TKIP is the next generation of WEP, the Wired Equivalency Protocol, which is used to secure 802.11 wireless LANs. TKIP provides per-packet key mixing, a message integrity check and a re-keying mechanism, thus fixing the flaws of WEP.

802.1x Authentication

802.1x is a framework for authenticated MAC-level access control, defines Extensible Authentication Protocol (EAP) over LANs (WAPOL). The standard encapsulates and leverages much of EAP, which was defined for dial-up authentication with Point-to-Point Protocol in RFC 2284. Beyond encapsulating EAP packets, the 802.1x standard also defines EAPOL messages that convey the shared key information critical for wireless security.

Advanced Encryption Standard (AES)

Security issues are a major concern for wireless LANs, AES is the U.S. government's next-generation cryptography algorithm, which will replace DES and 3DES.